

SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

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STORMS OF JUNE 27TH.

HAVING reported so fully on these storms in our last number, we cannot allow them more space save by way of correction and elucidation. To the report from Whetstone we added (p. 47) a protest, which is confirmed by the following note :—

WHETSTONE.—“I am obliged to you for the copy of your journal ; and beg to say, with sorrow, that I made a most unaccountable mistake in saying that the body of cloud moved E., when the fact was it moved W. The mistake was very foolish on my part, and the only reparation I can make is to acknowledge it promptly.”

Thus the details of the Cricklewood storm are *all* reconciled, and *it* may be as considered settled. The Hampton Court storm is involved in some uncertainty; our able correspondent at Gomer House is unshaken in his opinion that it passed over him from E. to W., and most unfortunately no one appears to have noticed the aspect of the broken windows at neighbouring places ; perhaps this will remind readers, that in case of hailstorms, the direction is best shown by broken windows, just as the direction of gales is shewn by prostrate trees.

STORM ON THE COTSWOLDS.

On the night of 27th, the Cotswold Hills and the adjoining valley of the White Horse were visited by a tempest of extraordinary severity and duration. Until five o'clock in the afternoon no indication had presented itself of the coming storm, but shortly afterwards the light and fleecy clouds, erratic in their motion, significant of atmospheric disturbances, were rapidly succeeded by densely black volumes, which almost without notice commenced a conflict of terrible and sublime grandeur. The storm seems to have culminated in the Bourne, near Northleach. At Foss Bridge Inn, the flood was so great that it flowed into the house and attained a depth reaching to the window sills of the general apartments, while in the cellar it acquired a depth of five feet. The church of the village was surrounded by water exceeding three feet in depth, while the roads in places were burst, and the walls thrown down. On the same afternoon at Shaftesbury, a heavy thunderstorm, which lasted upwards of an hour, was experienced. The lightning was very vivid, with loud peals of thunder, and the rain fell in torrents, stopping the gutters, and in some instances rushing into the dwelling-houses of the inhabitants. At Melbury Abbas the storm was accompanied by hail, which did great damage to windows, and killed some fowls.

Chepstow, July 18th, 1866.

MY DEAR SIR,—As I find from the report in the “Meteorological” that the thunderstorms of the 27th ultimo were more general and peculiar than I had supposed, I send some particulars of the passage of one over this neighbourhood, which may be acceptable, inasmuch as you have none from any place nearer this than Newport.

The first indications were visible in the direction of Newport at 5.30 p.m. ; the first thunder heard at 5.50, at which time the telegraph operator at the Railway Station informed me he had received some severe shocks, due to the electrical state of the wires. At this time, as I afterwards heard, the storm was raging severely in the low grounds between Newport and this, especially at Caerwent

(5 miles distant), where the hailstones were larger than ordinary filberts. From that point the northern boundary of the storm was bent in an E. direction (the line from Newport to Caerwent being N.E. $8\frac{1}{2}$ miles) and just touching the point of land at the junction of the Wye and Severn, (5 miles) it again took a N.E. direction, crossing the Severn at a slight inclination, and reaching the Stroud valley (through which the Great Western runs to Swindon) 19 miles further, at 7.40. This latter information I had from a friend who leaving this at 6 p.m. watched the progress of the storm from the railway on the west bank of the Severn, and met it at the latter point on the east bank. The high lands of the Cotswold range at the head of the valley seem to have terminated the storm in that direction, inasmuch as both the time and direction given by your correspondent at High-worth (Swindon) lead to the inference of a distinct storm. At any rate, the same storm if it began at Cardiff at 4.30 (though your report from Penttyrch infers it came from Neath 35 miles further westward) is thus distinctly traced for at least 53 miles.

During the passage of the storm, 2 miles to the southward of this, the sky was obscured by heavy masses of electrical clouds, but no rain fell, although the view was quite shut off to the southward by the sheets of rain which deluged that part. At 7.10, however, a heavy cloud *returned from the east*, and from this we had a few large drops, about one to each superficial foot, but no more during the night, the minimum temperature of which was 60° . At Gloucester no rain fell, but at 9 p.m. lightning was seen in the direction of the Malvern hills. I hope some of your observers will be able to trace a similarly defined line for the southern boundary of this remarkable storm.

Your's very truly,

JAMES G. WOOD.

P.S.—As regards the startling account of ice at Newport, on which you have a note (p. 52), it is quite possible that the pieces had frozen together *after* they had fallen.

J. G. W.

SIMPLE BAROMETRIC FORMULÆ.

A SIMPLE RULE FOR MENTALLY DETERMINING DIFFERENCES OF HEIGHT BY THE BAROMETER.

To the Editor of the Meteorological Magazine.

SIR,—For rough work like that described by your correspondent, "A Lazy Man," last month, it will be sufficient in all cases where the reading at the higher station does not fall under 28 inches, to multiply the difference of the readings in hundredths of an inch by 9, or if much lower, by $9\frac{1}{2}$. This will not, perhaps, give a very accurate result, but it will be nearer than that indicated, and has the advantage of being easily remembered. For instance, suppose the reading at the bottom of the mountain to be 30, and at the top 28 inches. 200 hundredths multiplied by 9, will give 1800 feet, about 13 feet less than the truth. The rule might easily be made more precise, but it would involve a little calculation and a little effort of memory, which would be too great a task on the energies of "A Lazy Man."

Higher readings require a somewhat lower, and lower readings a somewhat higher multiplier. No correction for temperature is required for the aneroid. With Negretti and Zambra's pocket barometer, a useful table of differences is given, and I have constructed a little scale which I keep in my pocket-book and which answers every useful purpose. Of course this scale finds much more accurate results than the rough rule given above.

If not too much trouble, the reading at the bottom should be noted both before and after the ascent, the mean to be taken as the real observation.

Yours truly,

Barlstone, July, 10th, 1866.

W. S.

DEAR SIR,—If you think it worth while to publish anything more on the subject of *exact* and *easy* barometric altitude tables, I beg to submit to you a table which I have arranged and computed for my own use, and which I believe possesses considerable advantages over all others known to me.

English mountaineering is performed much more frequently under a temperature of 62° , than at 32° . These tables are computed for temp. 62° , and therefore will

need no correction at all in 9 cases out of 10 when most other tables are most at fault unless that correction is applied.

When the temp. is much above or below 62°, the alteration of the readings of the Bar. at the rate of 1 inch for 15° or .2 for 3° is so very simple and easy, as in my opinion to distance all competition. The whole business is, therefore, reduced to three very easy operations: (1.) Correcting bar. readings for temp. of air. (2.) Interpolation between the terms in the table. (3.) Subtraction.

There is no multiplication, no division.

I will work out your own example.

Reading	29.890	26.656
62°—50°=12°	+ .800	+ .800
Corrected reading	30.690	27.456
Tabular Numbers	4633	1522
Difference	3111 = height in feet.	

I am, Sir, yours faithfully,
J. M. HEATH.

Milland, Liphook, 27th July.

COMPANION TO THE ANEROID, OR MOUNTAIN BAROMETER.

RULE.—When the temp. of the day is ^{less} than 62°, ^{increase} both the readings of the Bar. at the rate of 1 in. for every 15° of temp. below 62°, or 0.2 in. for every 3°. The difference of the tabular numbers opposite these corrected readings is the true vertical altitude.

Bar.	Vert. Alt.	Bar.	Vert. Alt.	Bar.	Vert. Alt.
	90		96		102
30.9	4824	28.9	2955	27.3	1363
	91		97		103
30.5	4460	28.7	2761	27.0	1054
	92		98		104
30.2	4184	28.4	2467	26.7	742
	93		99		105
29.9	3905	28.1	2170	26.5	532
	94		100		106
29.6	3623	27.8	1870	26.2	214
	95		101		107
29.2	3243	27.5	1567	26.0	0

RADIATION THERMOMETERS.

DEAR SIR,—There is a very interesting letter from “A. B.” in this month’s *Meteorological Magazine*, on the “Grass Minimum”. I cannot understand why the thermometer should be *raised above the ground*; for it seems to me, that it is the upper surface of the earth that is most cooled by radiation, and that the lower stratum of air of 4 or 5 inches thickness is only cooled by contact with the earth and grass.

The extra fall of the blackened minimum is probably due to the radiation of the bulb itself, black surfaces radiating better than any other.

The registration of the minimum upon grass is not of any scientific use, as it is impossible to compare observations made at different places, and for other reasons; but to farmers, gardeners, and others, is doubtless of great importance.

I would caution some of your readers about “Solar Maximum Thermometers in vacuo”. In some of these instruments by the first makers a thin cloudiness sometimes appears on the inner surface of the exhausted globe, which is next the sun, caused by an exceedingly small amount of water vapour being left in it. Any one possessing such an instrument should request the maker to change it, as its indications are worse than useless.

I am, dear Sir, yours very truly,
G. L. T.

RAINFALL IN JULY, 1866.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	HEIGHT OF GAUGE.		DEPTH OF RAIN.					Days on which -01 or more fell.
		Above Ground	Above Sea Level.	Total Fall.	Differ- ence from average 1860-5	Greatest Fall in 24 hours.			
						Depth.	Date.		
		ft.	in.	feet.	inches.	inches.	inches.		
I.	Camden Town	0	6	100	1·19	—·76	·24	28	11
II.	Staplehurst (Linton Park)	0	6	200 ?	2·73	+·75	·71	6	10
III.	Selborne (The Wakes).....	4	0	500 ?	1·38	—·83	·36	3	8
IV.	Hitchen	2	0	240	...	...	...	...	...
V.	Banbury	7	0	345	2·08	+·02	·91	28	12
VI.	Wisbech	0	6	10	3·02	...	1·11	29	14
VII.	Bury St. Edmunds (Culford).....	1	2	...	2·25	+·27	·50	1	11
VIII.	Calne	0	11	250	1·52	...	·50	2	9
IX.	Plymouth (Goodamoor)	0	2	580	2·42	—1·86	·66	6	11
X.	Barnstaple.....	0	6	31	2·60	—·26	·74	5	11
XI.	Taunton (Fulland's School).....	1	4	...	1·79	—·28	·47	3	12
XII.	Shrewsbury (Highfield)	5	6	200	1·61	—·46	·66	29	5
XIII.	Tenbury (Orleton)	0	9	200	2·17	—·22	·52	7	13
XIV.	Leicester (Wigston)	0	6	220	2·21	+·11	1·02	29	10
XV.	West Retford	0	6	50	2·70	+·64	·74	28	15
XVI.	Derby	5	0	180	2·41	—·22	1·57	29	13
XVII.	Manchester	2	7	106	4·31	+1·71	1·99	28	13
XVIII.	York	0	6	50	2·91	+·97	1·22	29	9
XIX.	Skipton (Arncliffe)	3	0	750	5·24	+2·01	1·20	28	12
XX.	North Shields	1	0	124	3·70	+1·89	1·46	30	9
XXI.	Borrowdale (Seathwaite)	1	0	422	11·18	+3·04	1·77	5 & 9	16
XXII.	Abercarn	1	3	450	1·62	...	·59	1	8
XXIII.	Haverfordwest	2	0	60	1·55	—1·74	·35	9	12
XXIV.	Rhayader (Cefnfaes)	2	0	880	2·41	—·44	·60	2	10
XXV.	Llanberis (R. Victoria Hotel).....	1	0	370	1·41	...	·34	8	8
XXVI.	Dumfries	0	5	70	2·84	+·60	1·01	29	12
XXVII.	Hawick (Silverbut Hall)	4	0	512	3·87	...	1·25	4	13
XXVIII.	Ayr (Auchendrane House)	2	3	94	3·32	+1·16	1·44	28	13
XXIX.	Otter House	0	6	130	3·38	+·07	·66	30	17
XXX.	Leven (Nookton)	0	6	80	2·87	+·60	·72	28	14
XXXI.	Stirling (Deanston)	0	0	130	3·27	—·13	·98	28	17
XXXII.	Logierait	1	0	250	3·16	...	1·45	29	11
XXXIII.	Ballater	0	10	656	2·58	...	·81	28	14
XXXIV.	Aberdeen	4	8	115	3·49	...	·66	29	19
XXXV.	Inverness (Culloden)	3	0	104	3·07	...	·96	30	12
XXXVI.	Fort William	0	8	20	3·27	...	·60	8	17
XXXVII.	Portree	0	4	60	3·90	—2·17	·84	2	15
XXXVIII.	Loch Broom	0	8	48	1·91	...	·36	4	14
XXXIX.	Helmsdale	1	0	34	1·50	...	·25	9	14
XL.	Sandwick	2	0	78	1·64	—·25	·68	2	8
XLI.	Cork	6	0	65	·44	...	·18	5	8
XLII.	Waterford	4	0	60	·85	—2·46	·28	4	8
XLIII.	Killaloe	5	0	128	1·96	—1·23	·49	2	14
XLIV.	Portarlinton	9	0	236	1·22	—2·32	·36	6	14
XLV.	Monkstown	0	6	100	·89	—1·54	·22	3	13
XLVI.	Galway	6	0	25	1·94	...	·35	13	15
XLVII.	Bunninadden (Doo Castle)	1	0	...	2·04	...	·47	13	15
XLVIII.	Bawnboy (Owendoon)	1	3	218 ?	2·66	...	·63	13	17
XLIX.	Waringstown	0	4	191	2·98	...	·70	29	14
L.	Strabane (Leckpatrick)	0	5	260	1·96	...	·54	28	12

+ Shows that the fall was above the average ; — that it was below it.

METEOROLOGICAL NOTES ON THE MONTH.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain.

ENGLAND.

CAMDEN TOWN.—A fine month, showers in the first and last weeks. Hot from 9th to 21st, but rest of the month cool, some nights chilly. TS on 4th 3 p.m. and 6th 6.30 p.m.

LINTON PARK.—Frequent heavy showers every day for the first week, afterwards hot, dry, and fine to the 28th; the last four days showery; T on 1st, 6th, and 29th; the hottest days were the 12th, 14th, and 15th. Some corn cut at the end of the month, but harvest not general, the second and third weeks being fine, favoured the getting up of the hay, which, though late, has been a better crop than for some years. The prevailing winds have been W.S.W., with often sudden changes without affecting the general character of the weather. Fog on mornings of 21st and 23rd.

SELBORNE.—T on 1st, 2nd, 5th, and 6th; on 15th at 4 p.m., and on 16th at 2 p.m., distant T was heard. High winds on 9th and 10th. Max. 80° on 12th. Prevailing winds S.W. early in the month, latter part N.W.

BANBURY.—Heavy showers with hail and T on 1st, 5th, and 6th. Max. 83° on 12th. Hay-making very nearly completed at the end of the month, crop heavy.

WISBECH.—T S with hail at noon on 1st. TS at 2 p.m. on 5th, heavy rain from 3 to 4 a.m. on 29th, total fall during the 24 hours 1.11. Max. 89°.4 on 13th. Fog on morning of 21st.

CULFORD.—T on 1st. Max. 88° on 13th. Mean temp. of this month is rather less than that of the preceding (June) being 61°.2 to 62°.8. Wheat harvest commenced in this neighbourhood on the 19th, but has not become quite general yet, the last five days of the month having been more or less rainy.

GOODAMOOD.—A beautiful month, but remarkable in this part for the absence of TSS, not a flash of L have I seen. Max. 84°. The rainfall of the first 8 days and the great heat after did wonders in forcing on vegetation.

HIGHFIELD, SHREWSBURY.—Max. 87° on 12th.

ORLETON.—Heavy R followed by T and L at 11.16 a.m. and 4 p.m. on the 6th. The first week cold and showery; very fine from the 8th to the 26th, without any R, and occasionally very hot; cold and stormy thence to the end of the month. Temperature very variable, but a little above the average. Max. 84° 2 on 12th; hazy for many days.

WIGSTON.—The range of the max. ther. during the month has been greater than I have ever known; on the 12th the reading was 92° 5 and on 31st only 57° 0, the heat of the 12th was 3° more than I have ever recorded; this district has suffered more from drought than almost any other, consequently the ripening of the corn has been more rapid. Wheat being ripe and reaping commenced on the 30th.

W. RETFORD.—It is with deep regret we announce the death of the able observer at this station—(The Rev. C. D. Butterfield).

DERBY.—July commenced and ended wet, the intermediate period being dry and unusually hot, allowing the great bulk of hay in this neighbourhood to be led in excellent condition. An earnest and steady R commenced on Saturday night (29th) and continued till 7.50 on Sunday morning (30th), 1.57 in. having fallen in the 24 hours; the Derwent has filled its banks, and another half inch of R would flood the low lands, but as the bar. is rising and the wind N. probably the weather will improve.

ARNCLIFFE.—From 10th to 26th beautiful weather, cold towards the end of the month. Max. 90° in shade.

NORTH SHIELDS.—TS on 13th; fine dry month till the 28th, on the evening of which day R began to fall heavily, it continued through the 29th; the morning of 30th was fine, but at 5 o'clock it again began to R; during the night 1.46 in. was measured; wind N.E. and a heavy storm.

SEATHWAITE.—Splendid weather from the 15th to 27th; Max. (at Tarnbank) 79° 4. Five days on which the R exceeded 1 in.

W A L E S.

ABERCARN.—A dry warm month, with 14 cloudless days.

HAVERFORDWEST.—July commenced with high winds, R, and a low temp. seldom reaching 60°; thence to the 27th, the temp. was above the average for this locality, exceeding 70° on many days; the latter part of the month was very close and sultry, with a damp foggy atmosphere, rendering it very unhealthy and oppressive, the last three days were fine and fresh; wind very boisterous from the N. with a considerable fall in the temp. No T during the month. The prospects of the harvest are generally favourable.

CEFNFAES.—Slight T S on 27th; thick haze on the hills from 23rd to 26th; month generally dry and hot. Max. 88° on 15th.

S C O T L A N D.

DUMFRIES.—First nine days showery; from 10th to 26th, weather hot and scorching, pastures dried up and withered by the drought, streams very low, fine weather for haymaking. Max. on 12th 88°; at the close of the month, four days wet, rainfall on 29th very heavy (1·01 in.) R of immense benefit to pastures and turnip crop; harvest commenced with cutting barley on 30th, and will be general after the 6th of August. Wheat is a good crop, oats are light and below the average, potatoes are very good.

SILVERBUT HALL.—Heavy fall of R on the 4th, half-an-inch falling between 10 and 12 a.m., severe T S on the 13th, L of the forked and ball kind, very vivid and T very loud, the month taken as a whole may be said to have been a favourable one for gardeners and husbandmen.

AUCHENDRANE.—On 2nd at 11 a.m. a very heavy shower of H, which for a time made the ground appear white; on 1st and 5th slight T S at a distance, (the only T of the month), the severe TSS which prevailed on the 16th over the E. and S.E. of Scotland (between the Grampians and Roxburghshire) did not reach here, the day, though sultry with dense and heavy clouds, being fine. On the 28th 1·44 in. of R fell, which slightly, and only for a short time, increased the water in the rivers which had been, and continued very small during the month.

OTTER HOUSE.—Little or no R from the 11th to the 29th, the R above the average; colder than June, but favourable to the crops.

NOOKTON.—The weather warm and fine, changing with R to a lower temp. on 26th.

DEANSTON.—Only ·46 in. of R fell from the 11th to the 26th; distant T in the N. on the 4th, and in the E. on 13th. Max. 81° on 4th.

LOGIERAIT.—Very hot from 4th to 27th; a very severe T S on 15th, several slight accidents from the L; first T at 3 p.m., between 5 and 6 the L was very vivid and the roll of the T almost incessant, storm ceased at 6.30. Hay not a heavy crop, but secured in fine condition. Pastures suffering from drought, and harvest prospects not very good. Max. 83° on 12th.

BALLATER.—Some very warm weather in the early part of the month, ther. in shade on 12th being 86°·6; on the 13th a severe T S in the afternoon from S.W. to N.E.; from 5 to 6.30 p.m., the L was very vivid and continuous, and T tremendous, H and R accompanied the storm but no damage was done; from the 15th to 26th, dry, easterly winds caused the crops to suffer, but from the 26th to the end more than 1·50 in. of R fell. Haze on the 13th, and on the hills on 25th.

ABERDEEN.—T on 1st, 2nd, 3rd, 4th, 5th, and 13th; fog on 13th, 29th and 30th. Max. 78°·2 on 11th. Rain and wind rather above the average of last 10 years; temp. rather below it.

FORT WILLIAM.—On the whole the month has been a very pleasant one; less R has fallen than is usual at this season of the year, and water for domestic purposes has been scarce; the formation of the country is such that much moisture is required. In July last year nearly 2 in. more R fell than this year.

PORTREE, ISLE OF SKYE.—Very fine weather, crops of all kinds looking well; potatoes of excellent quality and very abundant, no appearance of blight at present; there has not been such a long dry time in this island in the memory of the oldest individual as there has been this summer. Water supply very scarce, many of the springs being dried up. No storms of any kind during the month.

LOCH BROOM.—A remarkably dry month; were it not for the copious dews at

night the consequences would have been serious ; the cereals though short will be more than compensated by the luxuriance of the turnip and potatoe crops ; our running streams do not show any increase, and the ordinary brooks are still dry, an occasional shower does not appear to have any effect upon them. On the 13th we were visited from 3 to 8 p.m. by the most terrific T S we ever remember, the L was vivid and almost incessant, while the T was awfully near, the amount of R accompanying this storm was wonderfully small.

HELMSDALE.—The heaviest T S that has visited this country for many years passed over this district on 16th, from S.E. to N.W., the L was very vivid and beautiful, the storm continued almost without intermission from 3 p.m. on 16th to 1 a.m. on 17th, but the amount of R that fell was very small.

SANDWICK.—Four peals of T with heavy H on 2nd ; severe T S from about 3 to 6 a.m. on 14th, which passed a little to the eastward of this place. Stratus filling the valley on morning of 31st, and Aurora at night.

I R E L A N D.

KILLALOE.—Max. $83^{\circ}5$ on 12th.

MONKSTOWN.—A very dry month, scarce any R from the 5th to the 27th. Millers complaining of want of water in the streams and rivers. The crops all look remarkably well, the hay well saved, in most places it is a very plentiful crop. Some days were warm but only nine above 70° . Max. 78° on 10th. On the 31st the mountains in Co. Down, about 60 miles distant, were perfectly clear down to their very bases, this extreme clearness was succeeded by very heavy R on 1st August.

DOO CASTLE.—Wet till the 8th, from which to 25th no R fell, save .47 in. on the 13th. Remainder of month more or less wet, 16 days of this month were delightful. Fog on morning of 11th. No T or L.

OWENDOWN.—This has been a most favourable month, and all crops are looking very well. Hazy on 27th.

WARINGSTOWN.—Fine seasonable weather throughout. All crops looking unusually well, but somewhat late.

LECKPATRICK.—Fine, no R for a fortnight in the middle of the month. Max. $81^{\circ}4$ on 12th. R at the end of the month came in very usefully for the crops.

DISCOLORATION OF PAINT BY RAIN.

Trinity College, Dublin, July 2nd, 1866.

MY DEAR SIR,—Aware as I am of the deep interest you take in everything connected with Meteorology. I think the following may not be unacceptable to you.

For some time past I have noticed on walking through the city during the prevalence of rain, that certain hall doors appeared *stained* wherever a drop of rain had fallen on them.

This effect lasted for some considerable time after the rain drops had evaporated. So far as I have been able to ascertain, but one description of paint undergoes this strange transformation, viz., a *dark green*. Also, this curious effect is but seldom observable, perhaps on not more than eight or ten days in an entire year. From inquiry and from observation I have arrived at the following facts.

First, as regards the composition of the paint, which seems most influenced, it is *Dark Brunswick Green* (i.e. "Muriate of Copper.")

Lampblack.

English Umber (i.e. an ore of iron and manganese)

"*Patent driers*" (a mixture of whiting, Ca O, Co₂, and Zu O, So₃.)

Secondly, as regards the occasions on which this phenomenon is usually observed.

Heavy rain, and high wind, resulting from a union of S.W. and N.E. currents, the barometer being generally very low, the wind strong from S.E. or S., and a large *per centage of ozone* being frequently noticed. Probably we may have in this phenomenon a ready test for ozone, or it may be that *ammonia* gives origin to the stains left by the rain drops.

If you think it worth while, you might kindly lay these facts before the readers of the "*Meteorological Magazine*."

Yours very truly,

JOHN WILLIAM MOORE, B.A., SCH. T.C.D.

P.S.—The stain is of a *slate-blue* colour. The last day I noticed the effect was the 18th of June, when the state of the weather was as follows :—

Very wet, 1.163 in. of rain in 24 hours, wind E.S.E., upper current from S.W.

to S. Barometer 29.46, and thermometer but 48°, the wind also was very high, ozone 100 per cent. at the Ordnance Survey, Phoenix Park.

As it seemed desirable to solve the problem as soon as practicable the above letter was submitted for report, and the following note received:—

DEAR MR. SYMONS,—I have read over Mr. Moore's communication to you which you placed in my hands. I fear, however, that without personal inspection of the phenomenon he describes, I can offer little else than plausible guesses.

It is very common with painters to cover a surface with ultramarine before putting on Brunswick green, and to lay on the latter pigment only in a comparatively thin coating. After the oil used for mixing has become oxidised and dry (and this happens very soon when "turpentine substitute" has been added in large quantity) the two layers are in close contact; and water by rendering the outer thin layer more transparent, might cause the ultramarine to show underneath.

The only source of ammonia in the rain which I can imagine at the present moment, is the vapour from gas-liquor. If the liquor were being collected into casks at the gas-works for sale, and the wind was blowing from S.E. at the time, this might possibly account for the slate-blue appearance. Such a supposition is, however, very unlikely.

Ozone can have nothing to do with the matter. There is no good evidence that ozone ever occurs in air.

I would advise your correspondent to apply to one of the resident teachers of chemistry in Dublin; the question would probably be settled immediately.

I am, yours very truly,

University College, London.

EDMUND J. MILLS, D.Sc. F.C.S.

A NEW ENEMY TO RAIN GAUGES.

MY DEAR SIR,—I have just encountered a new enemy to rain gauges, which had I not discovered it in time, or had I not kept several gauges of different sizes, heights, &c., might have caused me considerable annoyance. On looking into the receiver of my Apps' gauge (5 in.), I detected a small leaf, and, supposing it to have been blown in by the wind, proceeded to remove it, when I saw several more equally small, and some fragments. On carefully examining these leaves and fragments, I discovered that the pipe of the receiver of the gauge was completely filled up with nine nests of one of the genus *Megachile*, or leaf-cutter bee. I had great difficulty in removing them, so beautifully were they fitted and soldered as it were to the tube. To prevent the recurrence of this, I have fastened a little cap over the aperture of the pipe, leaving just sufficient space to allow the rain to trickle through freely, but small enough to exclude a similar invader on any future occasion. Thinking you might like to notice this in the next number of your *Meteorological Magazine*, I send you this account.

Yours always, very truly,

Strathfield Turgiss Rectory, July 20th.

C. H. GRIFFITH.

THE TRUE HISTORY OF A THUNDERBOLT.

ON July 2nd one of the London daily papers startled some of its readers by inserting a letter on the thunderstorm of June 30th, in which the writer said, "At six o'clock it broke out again with increased violence, the rain descending in torrents, and at a few minutes past seven a thunderbolt fell in the gutter opposite my house (in Westbourne Park, Notting Hill) and was smashed to pieces, one of which I have at the hour at which I write. Numbers of persons are still searching for the fragments."

Feeling certain that there was a weak point somewhere, inasmuch as "thunderbolts" have no existence, we called on the writer of the letter and other residents, found the story amply confirmed, received several pieces of the "thunderbolt" (by the bye, some were sold at 10/- and 15/- each), and eventually ascertained that one of the pupils of an analytical chemist had availed himself of his tutor's absence to fill a capsule with materials calculated to burn vigorously, and explode in heavy rain, and, during the height of the storm, had thrown the burning mass into the gutter, so making an artificial thunderbolt. It is no wonder that the neighbours were taken in by a trick so well-arranged.